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AUTHOR Lien, Hsi Nancy; Jeng, Ifeng; Yin, L. Roger
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ABSTRACT

In the current education literature, the World Wide Web, a subset of the Internet, has an image of freedom and liberation based on its capacity to transcend the conventional notions of time and space and its potential to offer unlimited educational opportunities. This paper suggests that the use of the Web in education tends to reproduce preexisting structures of power and knowledge. Reading the meanings that the Web brings into education through the philosophical lenses of postmodernism, poststructuralism, and critical theory, the paper contends that use of the Web in public schools in the United States embodies a paradox. On the one hand, the computerization of knowledge seems to provide the postmodern societies with an opportunity for liberation by providing an equal, free and open environment for exchanging diverse choices and voices, symbolizing human emancipatory cognitive interest. On the other hand, the pleasure of gaining information may create a smoke screen that hides social injustice through its redistribution of knowledge and its lack of equal opportunity through equal access. The paradox can be understood as a dilemma of human interest pursuing liberation only to be further alienated. (Author/AEF)

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The Paradox of The World Wide Web in Education: An investigation of the links between power, knowledge, and human interest of inquiry

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Hsi Nancy Lien
Department of Curriculum and Instruction
Indiana University at Bloomington
14808 W. Hidden Creek Ct.
New Berlin, WI 53151
phone: 414-796-8296
hlien@indiana.edu

Ifeng Jeng
Department of Instructional Systems Technology
Indiana University at Bloomington

L. Roger Yin
Technology and Information Resources
University of Wisconsin at Whitewater

Presented at the annual meeting of the
American Educational Research Association
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Abstract

This paper examines how the information technology influences U.S. public schooling. In current education research literature, the World Wide Web, a subset of Internet, has acquired an image of freedom and liberation for its capacity of transcending the conventional notion of time and space, thus offers unlimited educational opportunities. However, in this paper, the authors argue that the use of the Web in education tends to reproduce preexisting structures of power and knowledge. Reading the meanings that the Web brings into educational context through various philosophical lenses: postmodernism, poststructuralism, and critical theory, the authors contend that the use of web in public schools in the United States embodies a paradox. On the one hand, the computerization of knowledge seems to provide the postmodern societies with an opportunity for liberation by having choices and diverse voices in equal, free, and open environments. The Web symbolizes human emancipatory cognitive interest. On the other hand, the pleasure of gaining information may create a smoke screen to hide social injustice through its redistribution of knowledge and unequal opportunity of gaining access in this new language game. The paradox thus can be understood as a dilemma of human interest of pursuing liberation, but only to be further alienated from the selves.

Introduction

Since the World Wide Web sprang to life on the Internet five years ago, the population of net users has grown rapidly world wide from one to some forty million people (Hof, et al., 1997). As Lyotard (1984) foresaw 25 years ago, computer technology is transforming knowledge into information at a striking speed today. The very nature of the Web - the speed of delivery and the capacity for storage, seemingly free access and free association, and the presumably diverse information - is capturing the imagination and interest of educators around the world. From preschool to graduate school, the rapid development of the Web challenges educators to reconceptualize the very meaning of teaching, learning, and schooling (Hinkson, 1995; Yin & Pan, 1996).

In the meantime, U.S. government administrators and business sectors have teamed up to promote the information superhighway (National Institute of Standards and Technology, 1994). When President Clinton claimed: "education depend upon computers" in 1995; and Secretary of education Richard W. Riley's said: "Computers are the new basic of American education, and the Internet is the blackboard of the future" in 1996, computer literacy is understood as essential for the nation to survive in a global economic competition and for the individual to actualize American Dream. It becomes the bridge between now and the future for American education and society.

When wiring the school is seen as the answer to improve U.S. public schooling, the most critical analyses on the impact of Internet on local, national, and global information infrastructure are raised by people outside of education such as telecommunicators and media critic (Kenway, 1996; McChesney, 1996; Postman, 1986, 1993). Education research literature has focused attention largely on the future potential of the Web in schooling: how the Web will revolutionize communications,

create a global electronic learning environment, redefine our education, and the strategic application of the Web in education (Hof et al., 1997; Owston, 1997; Rakes, 1996; Uline, 1996). Although a few educational researchers have warned that students may be unable to use the flood of information constructively (Snyder, 1994), the focus of the conversation is more of an evaluation of the pedagogical values of the Internet than a critical examination of whether the Web can lead to better schooling. In this "information age" brought about by the proliferation of computer technology, a discussion of what role public schooling plays, what function it serves, and whose interests it serves is hard to find in current education technology proposals. Moreover, in the current research literature, the critical discussions on computer technology are simplified as resistance to change, as if any change that comes with computer technology is naturally beneficial to all (Tapscott, 1996; Starr and Milheim, 1996; Rakes, 1996; Hert, 1994; Connell and Franklin, 1994). The fact that the existing education literature on the impact of the Internet in education consistently endorses the perspectives of business leaders and corporate executives on what goals public education serves prompts us to critically examine the uses of the Internet in the classroom.

In this paper, we try to understand the educational meaning of the Web in this culturally diverse and economically stratified society: What promises have been given to the public while educators claim that the use of the Web will revolutionize learning in the 21st century? What images has this newest form of computer technology introduced into our notion of freedom and liberation? Will this very new form of human communication bring us to a new stage in which the interests and knowledge of both individuals and diverse communities are shared by each other in a society where people are so close, yet so far away? Given Dewey's notion of democracy as not just a form of government, but a way of life in which freedom of association and interests sharing among social members and groups

is not just desirable, but also possible, will using the Web increase our participation in this ostensible democracy? Or will the capacity of gaining access to information give us a false sense of happiness and thus cover up a deeper control, more efficient surveillance, and further stratify social inequality in a society already deeply divided along the racial and class lines? Moreover, when globalization of knowledge is occurring through the web, what and whose knowledge is privileged? What sorts of global views can be developed while some human knowledge is facing the challenge of being washed out through the transformation of knowledge into information? In short, we try to explore the relations among power, knowledge, and the free pursuit of personal inquiry in the context of the Web in education in order to further understand the function of schooling in an information age.

Methodology

In our research, we use analytical methods which apply logical induction to analyze and interpret the changes that the Web brings into the educational context. We use discourse analysis to interpret the possible meanings of the Internet to education. Three philosophical modes of thinking - postmodernism, poststructuralism, and critical theory - are employed to read the meanings of computer technology differently in relation to power, knowledge, and human interests of inquiry. Through various philosophical modes of thinking, we realize that the notion of technology is held differently among Lyotard, Foucault, Adorno and Habermas. These investigations cause us to conclude that a paradox exists in the movement to extend the Web to classrooms.

Although the analysis is based mainly upon the current research literature and national reports on the Web in education, some experiential data such as the interviews conducted in March, 1998 with one computer teacher working in an inner city school in Wisconsin are used to help the authors

contextualize the complexity of the movement to wire the schools. The authors recognize the limited generalizability of statements made by one teacher in one school. However, we believe that the insights provided by the teacher have merit given our own understanding of current educational structures and teaching conditions that teachers face in schools across the country.

The promise: freedom, liberation, and equity

In the educational research literature, the Internet is mainly portrayed as learning tool that can transcend the traditional boundaries of time and space. In the cyberspace, the boundary among institutions such as schools, libraries, homes, communities, and work places are not a clear cut. And it makes national boundaries meaningless. it permits immediate access to huge amounts of data 24 hours a day from wherever a telephone call can be made.

To educators, it seems to offer unlimited educational opportunities. Education researchers suggest that it can integrate multimedia resources to an interactive teaching and learning environment; provide links to valuable remote educational resources; allow educators to publish hypermedia in educational environments; allow learners to acquire up-to-date information 24 hours a day; motivate and engage learners to create their own "home pages;" and encourage a true learner-centered environment (Rheingold, 1993; Cutler, 1995; Goodenow, 1996; Yin and Pan, 1996; Owston, 1997).

Researchers also claim that the freedom of press on the Internet, unlike traditional print publications that are controlled by publishers, symbolizes a new democratic era. One can freely exchange E-mail messages, post opinions on the news groups, and put multimedia hypertext pages on the Web, with the requirement that one has the access to the cyberspace via a computer. Any author is assuming a

publisher's role, while any reader acts like an editor (Ryder and Wilson, 1996). Although there are inevitable "junk E-mails," "spams" or frauds caused by opportunists or electronic criminals just like the real world, every participant of the virtual community is exercising democratic rights to become a new citizen of the information age. In cyberspace, a child can express his or her opinion as being "virtually" equal to any other adult citizens (Fishman & Pea, 1993). The official knowledge produced by cultural institutions such as main stream media or textbook publishers can not be the only truth anymore. The era of ending the notion of absolute truth and universal truth all together is finally arrive.

Current literature on the Internet in education also suggests that another great potential of using Internet in education is teaching and learning without classroom boundaries. Class materials and courseworks can be delivered and retrieved from a distance. Discussions among the students and teacher can continue 24 hours a day. Conducting research no longer requires one to physically go to a library. Maybe a curriculum relevant to real-life expectations will be realized by integrating the ever-growing resources on the Internet (Doty, 1996). Or maybe one day schooling will not be the dominant form of education anymore (Lemke, 1993). With the non-linear nature in navigating or "surfing," the World Wide Web breaks the mold of the rigid class periods of the present school and offers an opportunity to those who prefer "finding what they want" to "being told what to do." The notion of hyperlinking liberates learners from a single page-by-page, step-by-step mode of reading, absorbing, and making sense. A great number of trials and errors during online activities, though risky and frustrating at times, provide learners constant decision-making practices. All it suggests is that the Web can liberate the individual from the control of

regime of schooling.

Contextualizing the Web in current education and social structure

American public school has traditionally had a dual function of social control and of preparing students for democratic citizenship. The very foundation of democracy is based upon the premise that citizens can govern themselves based upon the ability if given free access to information. The Internet, given its speedy delivery and its capacity for storage, seemingly free access and free association, and the presumably diverse information it contains, has prompted educators to claim that the Internet is redefining schooling (Rust, 1991) However, the promise that the Web brings is not always realized in actual school leaning contexts. There are four major areas the Web seems to hold potential for influence: equality of access, gains in literacy, the content, and instruction.

A. Equal access:

In Clinton's State of the Union address in January 1996, four goals were designed to fulfill the promise of democratic participation through free access of information in the information superhighway:

a. all teachers will have the training and support they need;

b. all teachers and students and students will have modern multimedia computers in their classroom;

c. every classroom will be connected to the information superhighway;

d. effective software and on-line learning resources will be integrated into every school's curriculum.

Race, class, and gender are critical factors in the equal access to the Internet. Although the population of net users is growing rapidly worldwide, the Net is still dominated by whites who contribute 85 percent of Net users (Cortese, 1997). And the Net population is skewed toward the affluent. In Campbell's (1984) report, the ever-growing number of private computer camps, after-school and

weekend programs serve middle class white boys. Most minority and poor parents cannot afford to send their children to participate in these programs. Although women account for a bigger portion of the Net population than ever before - 41 percent, up from 21 percent in 1995 (Hof, et al., 1997), the language of sexual harassment in Internet is reportedly a set back of women movement (Wylie, 1995).

The status of disadvantaged students - a disadvantage not due to "natural ability" but to wealth - may be heightened in the process of incorporating this form of technology in education. The above data cited make it necessary to ask who benefits when technology plays a major role in schooling.

Given the current social structure of racial segregation and class divisions in society in the upcoming information age, who will be most beneficial is obvious. The computer technology cannot help to change the system, but rather to join in and further enhance the current structure through the establishment of unequal Internet access. The statement made by Michael Casserly, the council head of the Great City Schools, in his interview by USA Today in the December of 1997 reflects the U.S. public school structure along the class line. He said, "Urban schools still are about half as likely to be wired to the Internet as the national average. For the 50 districts represented by the council, the range is from 10 percent to 80 percent of their schools, with some schools having only the principle's office wired, or the library, but not every classroom" (USA Today, December 17, 1997).

Inner city residents, largely concentrated by ethnic and racial minority and new immigrants, hold fewer job, requiring less skills and yielding lower pay, across the United States on average. While the expansion of the Internet benefits multinational corporations to cross countries and easily move their

low-end jobs to overseas or rural locations, the inner city residents suffer from the disappearance of employment. And the job opportunities created by the computer industry and the related service sector jobs in finance, business, management, and legal areas require more education than many inner city residents have attained (Hammond, 1994). Therefore, the National Information Infrastructure's (NII) goal of increasing the number of high-tech, high-pay jobs will not necessarily benefit inner city and rural residents (Hammond, 1994). Based on the realization that US public education is divided along race and class lines, it is reasonable to understand why a parent who has worry about putting the food on the table will not be able to afford any form of access to the Internet at home.

In responding to the Clinton administration's proposal to connect all U.S. public schools and their classrooms, computer labs, libraries, or media centers to the Internet, the National Center for Education Statistics (NCES) conducted a national survey in 1995, 1996, and 1997 on Internet access in public schools. Although the percentage of U.S. public schools with Internet access increased from 35 percent in fall, 1994 to 78 percent in fall, 1997, the access varied from school to school. This survey suggests that race and class are extremely critical factors in determining access to the Internet:

> "In 1997, schools with 50 percent or more minority students enrolled lagged behind schools with 20 percent or fewer minority students, as did smaller schools (those with fewer than 1,000 students), which are more likely to be elementary than secondary schools. Also lagging in Internet capabilities were schools with 71 percent or more poor students (that is, students eligible for free or reduced-price lunch), with 63 percent having access; however, schools with 31 to 70 percent poor students have recently made considerable gains in Internet access, moving from 58 percent in 1996 to 78 percent in 1997" (NCES, 1998, February).

In the NII Report, four guiding principles promise democratic participation through free access of information in the information superhighway. However, the NII Report on computer technology, initiated by the Clinton/Gore administration, addresses the need to "guarantee the privatization of the

Internet." Therefore, whether the Information Superhighway will become the Information Super Toll Road is in question.

B. literacy and computer literacy: Participating in the Web

Although the Internet is flexible on image, sound, voice, and written text, the most popular means of communication on Internet is written language. The existing research literature suggests that the use of Internet in education can promote literacy (Mike, 1997). However, the kind of literacy it promotes is mainly on high level of literacy such as critical thinking skills, judgement on the truthfulness and logistic of the information. For children who are illiterate, on-line learning might not be an easy task. The problem that teachers encounter is far beyond the investment of the computer hardware and software or the access fee. The theme is further explained by a computer teacher in an inner city school:

> Nancy: "Some researchers suggest that the Internet is not only a research tool, but a communication tool which offers students opportunities for democratic participation. However, the literacy rate is quite low in the United States. I was wondering whether the children with low reading ability can be a part of this movement toward an information society? Or whether the use of the Internet will help children to improve their reading ability and further make meaningful argument on debate on pubic issues in Internet?"

> Teacher: "The reading level, the literacy rate of these kids, is just unbelievably low. I have one student that is reading below a first grade level, he is a six grader. The student is supposed to do a research project... on juvenile delinquency. He was trying to look for the information on juvenile delinquency. He has no ability to read the title of the book. He has no concept and no

ability to read the title of the book because his reading level is so low. If that is the case, how is he capable of accessing the Internet and reading information from the Internet, which is not easy. It's not presented in a user friendly way. Especially for someone at very low reading level. It's very confusing because they have to determine whether this web site is going to be something that they can use based upon a few words. If they can't read, how would they be able to tell in a few words whether this will be useful or not. I don't know what the answer will be as far as to try to equalize the participation in democracy through Internet... General information is there, the availability is there, but you need to be able to understand it and interpret it, and that where our problem is...

There are a few students I know who have computer at home, they know how to make their home page at home and they are interested in doing it. But the vast majority of the kids don't understand or know the fact that they could make a home page... Unfortunately, some teachers are like that, too. They don't know it's something that you can contribute to. They think they want the kids to do research in the Internet."

When was asked about the estimated percentage of students who have computer or Internet access at home, this teacher explained that it isn't just access ti information that is critical. Students have very different perceptions on what they can do with the information:

"We have about 115 in our (school) family. I would guess anywhere between 10 to 20 students have computers at home. The number is really low. I wouldn't think too many kids have free lunch and their parents have computers. I mean they are just trying to get enough money to pay for the food, the meal, it's quite impossible to buy a computer... And to some extend, the way they perceive the Internet is different according to their different experience

with it and their different economic background. With kids who don't have a computer at home, they see the Internet as this great tool that you can use to find out information about Rap music and wrestling, whereas kids who have computers at home, they see it as another phone line, they see it as another way to communicate with other kids, also have access to computer. It's amazing that I have these two groups, and you look at these kids. You get these kids who don't have computer all rushing to read and ruffle to read about their famous Rap stars, whereas kids with computers at home, they want to go on to e-mail somebody a message. We have the way they access, and how they see the Internet differently, as entertainment or communication."

Nancy: "So one group of students already are the consumers of the commercialized information, whereas the kids with computers at home see it as the chance to communicate with others or participate in a larger public space."

Teacher: "That's very much the case."

C. The content:

When the school is inevitably transformed into a profitable market, the industrialization of the school is obvious by opening up the classroom to the mass-produced commodities of industry. The technological "text" joins the existing textbook in the political economy of commodified culture. As a result, the schools are dominated by the interests of financial capital (Apple, 1986). Hence, the logic the computer follows pre-determines the selection of the knowledge. Although predicted by Goodenow, the Third World represents only approximately 10% of Internet access, with the USA accounting for 70% of utilization (Goodenow, 1996, p. 211). Western civilization may become the universal truth through the computerization of knowledge in which the English language could

possibly be privileged in this new language game guarded by capitalism. Thus, what we expect is diversity, but what we get is selected and commercialized information which is controlled by multi-national companies in the discourse of White culture.

D. Instruction

When the information super highway has great potential to become information super toll road, the quality of the road, may it be superhighway or toll road, is still questionable. The learning results of those wired school have not been critically examined. It is simply assumed to be better. The distance education in higher education is the case. For example, there are increasing numbers of distance education classes via the Web in higher education. The basic assumption of distance education is that its cost effectiveness and learning efficiency can help to reach more students who are disadvantaged in remote areas (Foa, 1993; Ragothaman and Hoadley, 1997; Sullivan, 1997; Murphy, 1997). However, the result on experiential case does not necessarily support the above assumption. In a pilot study of distance education conducted by the University of Wisconsin - Whitewater in the Spring of 1997, the performance of both enrolled college students and high school students (required to be in the upper 25% of their class if enrolling as juniors, or the upper 50% of their class if they were seniors) that take classes off-site declines comparing to those on-site (in average, college students' GPA's decline from 2.39 to 2.13; high school students' GPA's decline from 2.69 to 2.20). The cost is estimated to be higher than an average class. The reason is well explained in the final report quoted below:

> "We found that there was a very large increase in grading time required in electronic grading, to call up documents, type comments, and to compare papers to assure consistency of grading... it appeared to the instructors that the off-site students did not focus as well on

lecture material during class, without the physical presence of the instructor in the room. Because of the relatively large group of off-site students for the given facilities, at times it was difficult for the instructors to adequately monitor the attention and response of those pupils" (Urven, et al. 1999).

In the recommendation of future strategies to be implemented routinely in the future of distance education via the Web, the report suggests that class size or course load would have to be reduced to improve teacher incentives and grading turn-around time. Moreover, additional assistance may be needed at specific sites to allow monitored in-class exams.

Although this report suggests some disadvantages in distance education via the Web, it does not address the issue of communication through written language in teaching and learning. As suggested by an instructor who uses the Web to conduct distance education at Indiana University, communicating with students who have never met before through written language is stressful and may at times be frustrating for both teacher and students. Although distance education is not widely used in K-12 education in this country, it is reasonable to believe that it will take more effort for young children to learn through the Web, more work to plan and cooperate with teachers to conduct meaningful learning experiences through the Web.

Although many research suggests that the Internet is great for teachers to help students gain knowledge and information from the Internet outside of textbook knowledge. However, the existing workload in teaching is very heavy. Exploring the possibilities of the Web is time consuming, as is finding time for cooperation among computer teachers and teachers for different subject areas outside

of regular school teaching and other duties. Explained one computer teacher:

> "You are talking about the integration of the other classes in the computer. This year, there is relatively very little integration... It happen a little bit, they also have to do it in language art... I try to find out what teachers are doing in other classes and try to find out what I can help to develop a lesson plan with other teachers. It's very difficult. When teachers have time, it has to be done after school. The time factor is critical. They (other teachers) see it as additional work... Teachers right now are not familiar with the Internet. When they were in school, they were not taught about computers. We didn't have computers when we were in school. They feel uncomfortable to use the computer... The district does make an attempt to familiarize the staff with the computer technology... But the teaching load is realistically very heavy. There are a lot of additional things: discipline, contact the parent, grand box, lunch duty time. Unfortunately we are not going to get less.
>
> Nancy: So, is it reasonable to suggest that the Internet will transform the public schooling? Is that kind of like an overstatement?"
>
> Teacher: "Oh, it's a gross overstatement, especially in the current structure... It's not going to make everything correct, make everything perfect, make everyone better readers, give everyone equal access to the information. It's just not the case."

The paradox of the Web in education

The paradox lay within the logic we follow: development for technology or technology for development. To Lyotard, knowledge in the form of an informational commodity is and will be a major stake in the worldwide competition for power. He predicted that "anything in the constituted body of knowledge that is not translatable in this way will be abandoned and that the direction of new

research will be dictated by the possibility of its eventual results being translatable into computer language" (Lyotard, 1984, p. 4). However, in his model of "games of perfect information", the best performativity comes from the imaginative arrangement of data in a new way which allows one either to make a new move or change the rules of the game. Thus, by supplying information in speed, computer technology reinforces the ideal situation which occurs in the games of perfect information. Foucault's vision of technology is a set of operations or procedures, as joining of knowledge and power, coming together around the objectification of the body for the normalization of the modern individual life (Foucault, 1977). To Adorno, technology is a force toward totalitarian domination and creating a false consciousness of happiness by providing unlimited information (Horkheimer & Adorno, 1972). In Habermas's communicative theory, emancipation can only occur when the existence of a different kind of rationality is acknowledged - one that is necessitated by an equally fundamental interest in achieving an integrated identity through free, undistorted communication. To Habermas, the objectifying structure of science and technology is necessitated by the very nature of objective cognition and self-preservation. He believes that science and technology do not essentially tend toward totalitarian domination. But he also points out that science and technology do function as "ideology" in a society that stresses economic growth to the detriment of democratic self-determination nurtured in free, open discussion among social and political equals (Ingram, 1992).

In light of the above philosophical understandings of technology, the Web has a complex and dynamic cultural image. On the one hand, the computerization of knowledge seems to provide the postmodern societies with an opportunity to liberate themselves by having choices and diverse voices in equal, free, and open environments. The Web, with its speeding supply of information and free association of ideas, thus symbolizes human emancipatory cognitive interest. On the other hand, the

pleasure of gaining information may create a smoke screen to hide social injustice through its redistribution of knowledge and unequal opportunity of gaining access in this new language game. The paradox thus can be understood as a dilemma of human interest of pursuing liberation, only to be alienated from the selves.

Conclusion

It is undeniable that we are in the midst of a computer revolution. The development of the Web has shown its power in restructuring knowledge and changing many familiar structures. Many educators are eagerly incorporating the Web into their schools because it seems to promise unlimited information, and it seems to transcend some of the traditional constraints of schools. The developers of the Web view the schools as sources of revenue, with a captive audience of potential consumers. The motivations of students to use the Web vary according to several factors, including age, previous exposure, and social-economic status. Moreover, instead of offering unlimited information that is continually accessible, the current reality is that the use of the Internet in schools tends to reproduce already-existing structures of power and knowledge.

To us, the Web, the fastest growing industry in the dawn of the 21st century, symbolizes a discourse of power in which knowledge is transformed into information as the principle force of producing values, beliefs, and pleasure. Thus, we believe that curriculum theorists need to understand the array of meanings behind the very way the Web structures human communication. The central issue, then, is not to determine whether one says yes or no to Web, whether one asserts its importance or denies its effects, but to account for the fact that it is spoken about, to discover who does the speaking, the positions and viewpoints from which they speak, the institutions which prompt people to speak about it and which store and distribute the things that are said.

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